AMENDMENTS TO THE CLAIMS

Current Listing of Claims

1. (Currently amended) An in-situ method for sampling a particle-containing stream and measuring particle fineness using laser-induced incandescence (LII) comprising
   a) sampling particles in-situ by drawing a sidestream from a source of the particles using an in-situ eductor with a sample inlet and an in-situ critical orifice on the sample inlet wherein the sample enters a sampling system through the critical orifice,
   b) adjusting the sample to conditions suitable for LII,
   c) measuring the adjusted sample using LII, and
   d) correlating the LII measurements with actual particle fineness.

2. Cancelled.

3. Cancelled.

4. (Currently amended) The method of claim 1~~3~~ wherein the adjusting comprises adding secondary dilution air to the sample.

5. (Original) The method of claim 1 wherein adjusting the sample to conditions suitable for LII comprises diluting the sample.

6. (Original) The method of claim 5 wherein diluting the sample is to a level of about less than or equal to 90, 80, 75, 70, 60, 50, 40, 30, 25, 20, 15, 10, 5, 3, 2, 1, 0.7, 0.5, 0.4, 0.3, 0.2, or 0.1 ppm.

7. (Original) The method of claim 5 wherein diluting the sample is to a level of about less than or equal to 1 ppm.

8. (Original) The method of claim 1 wherein adjusting the sample to conditions suitable for LII comprises bringing the temperature of the sample to ambient conditions.

9. (Original) The method of claim 1 further comprising determining a correlation function by comparing LII measurements and laboratory fineness measurements for particle samples drawn at the same time.

10. (Original) The method of claim 1 wherein the sampling and measurement of particle fineness is done in real-time.

11. (Original) The method of claim 1 wherein the sampling and measurement of particle fineness is done on-line.

12. (Original) The method of claim 1 wherein the particles are carbon black.

13. (Original) The method of claim 1 wherein the particle-containing stream is in a carbon black reactor or reactor breeching section.

14. (Original) The method of claim 9 wherein the LII measurement is the decay rate of the LII intensity signal.

15. (Original) The method of claim 9 wherein the LII measurement is the decay rate of the temperature of the particles.

16. (Original) The method of claim 9 wherein the LII measurement is normalized specific surface area.

17. (Currently Amended) An in-situ method for sampling and measuring carbon black fineness in a process stream comprising

a) sampling carbon black particles in-situ from a process stream by drawing a sidestream from the process stream using an in-situ eductor with a sample inlet and an in-situ critical orifice on the sample inlet wherein the sample enters a sampling system through the critical orifice,

b) adjusting the sample to conditions suitable for LII,

c) measuring the carbon black fineness using LII, and

d) correlating the LII fineness measurement with actual carbon black particle size.

18. (Original) The method of claim 17 wherein the process stream is in a carbon black reactor.

19. (Currently amended) An in-situ method for sampling a particle-containing stream for LII-based particle fineness measurement comprising

a) sampling in-situ a particle-containing stream by drawing a sidestream from the particle-containing stream using an in-situ eductor with a sample inlet and an in-situ critical orifice on the sample inlet wherein the sample enters a sampling system through the critical orifice, and

b) adjusting the sample to conditions suitable for LII, wherein the sampling is done with a sidestream.

20. (Original) The method of claim 19 wherein the stream is in a carbon black reactor.

21. (Original) The method of claim 19 wherein adjusting the sample to conditions suitable for LII comprises diluting the sample.

22. (Currently amended) A method for sampling a carbon black stream for LII-based measurement of particle surface area comprising

a) drawing a sample of carbon black from the stream by drawing a sidestream using an in-situ eductor with a sample inlet and an in-situ critical orifice on the sample inlet wherein the sample enters a sampling system through the critical orifice,

b) adjusting the sample to conditions suitable for LII, and

c) providing the adjusted sample to an LII system for particle surface area measurement.

23. (Original) A method for controlling particle fineness during production of flame generated particulates comprising

a) sampling the flame generated particulate in-situ in the production process,

b) adjusting the flame generated particulate sample to conditions suitable for LII,

c) measuring particle fineness of the adjusted particulate sample using LII,

d) sending a signal related to LII-measured particle fineness to a controller,

e) comparing the particle fineness signal to a set point, and

f) sending a signal from the controller to adjust operation of the flame generated particulate production process.

24. (Original) The method of claim 23 further comprising correlating the LII-measured particle fineness to actual particle fineness.

25. (Original) The method of claim 23 wherein the flame generated particulate is carbon black.

26. (Original) The method of claim 25 wherein the adjustment of operation of the carbon black production process is via control of the air/feedstock ratio.

27. (Original) The method of claim 23 wherein the flame generated particulate is titania or silica.

28. (Original) An in-situ method for sampling a particle-containing stream and measuring particle fineness and aggregate size using laser-induced incandescence (LII) comprising
    a) sampling particles in-situ,
    b) adjusting the sample to conditions suitable for LII,
    c) measuring incandescence signals and scattering data for the adjusted sample using LII, and
    d) correlating the LII incandescence signals and scattering data measurements with actual particle fineness and aggregate size.

29. (New) The method of Claim 1, wherein the in-situ sampling of a) is performed at a temperature above ambient conditions.